

What is Claimed Is:

1. A method of operating a boiler system, the boiler system adapted to provide heat to maintain a first setpoint for a fluid heated by the boiler system, the method comprising:

receiving a signal indicating that a stage of the boiler system should be activated;
activating the stage at a first firing rate; and
maintaining the first firing rate unless a predefined condition occurs or a predetermined period of time expires.

2. The method of claim 1 wherein the predefined condition includes when the temperature of a circulating fluid in the boiler system drops below a predetermined level.

3. The method of claim 1 wherein the predefined condition includes when a rate of change for a sensed temperature for a circulating fluid in the boiler system rises above a predetermined level.

4. The method of claim 1 wherein:
the boiler system includes a boiler for heating a circulating fluid, the boiler having a primary heat exchanger and a bypass temperature sensor for sensing a bypass temperature of the circulating fluid entering the primary heat exchanger; and
the predefined condition includes a likelihood of condensation within the primary heat exchanger.

5. The method of claim 4 wherein the likelihood of condensation is predicted based upon sensing of the bypass temperature.

6. The method of claim 4 wherein:
the boiler system includes a secondary heat exchanger associated with the primary heat exchanger and an inlet temperature sensor for sensing an inlet temperature of the circulating fluid entering the secondary heat exchanger; and
the likelihood of condensation is predicted based upon sensing of the inlet temperature.

7. The method of claim 1 wherein the first firing rate is set independent of a sensed temperature deviation from the setpoint.

8. A controller for a boiler system having one or more stages, the controller configured to perform the steps of:
receiving a signal indicating that a stage of the boiler system should be activated;
activating the stage at a first firing rate; and
maintaining the first firing rate unless a predefined condition occurs or a predetermined period of time expires.

9. A controller as in claim 8 wherein:

the boiler system includes a boiler for heating a circulating fluid, the boiler having a primary heat exchanger and a bypass temperature sensor for sensing a bypass temperature of the circulating fluid entering the primary heat exchanger; and

the predefined condition includes a likelihood of condensation within the primary heat exchanger.

10. A controller as in claim 9 wherein:

the boiler system includes a secondary heat exchanger associated with the primary heat exchanger and an inlet temperature sensor for sensing an inlet temperature of the circulating fluid entering the secondary heat exchanger; and

the likelihood of condensation is predicted based upon sensing of the inlet temperature.

11. A method of controlling stages in a multi-stage boiler system, the method comprising:

receiving an indication that a stage that is not active is to become active;

determining whether the stage is the first stage to become active; and

if the stage is the first stage to become active, activating the stage at a first firing rate and maintaining the first firing rate unless: a predefined condition occurs; or a predetermined period of time expires.

12. A controller for controlling a stage in a multi-stage boiler system, the controller configured to perform the steps of:

receiving an indication that a stage that is not active is to become active;
determining whether the stage is the first stage to become active; and
if the stage is the first stage to become active, activating the stage at a first firing rate and maintaining the first firing rate unless: a predefined condition occurs; or a predetermined period of time expires.

13. A method of controlling a boiler system, the boiler system adapted to meet a heat load, the method comprising:

determining whether to activate a stage of the boiler system when no stages are active; and, if so:

activating a stage; and

controlling the stage with a stable firing rate independent of heat load unless/until at least one of a number of conditions is satisfied, wherein the conditions include:

whether the stage is no longer needed; and

whether a predetermined period of time expires.

14. The method of claim 13 wherein the conditions also include whether it is determined that the stage cannot operate without potential damage at the stable firing rate.

15. The method of claim 13 wherein the boiler system has a plurality of stages, wherein the conditions include whether the stage is not the first stage to become active in the system.

16. A controller for controlling a multi-stage boiler system, the controller configured to perform the steps of:

determining whether to activate a stage of the boiler system when no stages are active; and, if so:

activating a stage; and

controlling the stage with a stable firing rate independent of heat load unless/until at least one of a number of conditions is satisfied, wherein the conditions include:

whether the stage is no longer needed; and

whether a predetermined period of time expires.

17. A system controller for a multi-stage boiler system, the system controller having at least a first configuration and a second configuration, wherein:

the first configuration of the system controller enables the system controller to perform the steps of:

determining that a stage of the multi-stage boiler system that is inactive should become active;

signaling the stage to become active; and

indicating to the stage whether or not it is the first stage to become active;

and

the second configuration of the system controller enables the system controller to perform the steps of:

- determining that a stage of the multi-stage boiler system that is inactive should become active;

- signaling the stage to become active;

- determining whether the stage is the first stage to become active and, if so, providing a heat demand signal to the stage at a level selected to keep the first stage at a relatively low output level until one of a number of conditions is met.

18. The system controller of claim 17 wherein the number of conditions include:

- whether a predetermined period of time has passed; and

- whether the stage is no longer needed.

19. A stage controller for controlling a stage of a boiler system, the stage controller communicating with a boiler system controller, the stage controller performing the steps of:

- in response to the system controller signaling that the stage is to become active, activating the stage;

- in response to the system controller indicating that the stage is the first stage to become active, activating the stage at a first firing rate and maintaining the first firing rate unless a predefined condition occurs or a predetermined period of time expires.

20. The stage controller of claim 19 wherein, for the stage controller, a predefined condition includes a determination that condensation in a heat exchanger of the stage may be likely.